Workforce Development:
Information Technology Cluster

Report on Phase III Activities and Proposed Future Activities

USAID / Egypt

Draft - January 2001

<div align="center">

Information Technology Cluster
Workforce Development

Report on Phase III Activities and Proposed Future Activities

</div>

Background

In response to Gore-Mubarak initiatives to strengthen Egypt's position in the global IT economy, USAID identified IT as a cluster for focus of workforce development activities. A strategic planning workshop with key cluster stakeholders in December 1999, resulted in a preliminary plan of action to confront two principal workforce challenges in the cluster – the need for rapid introduction and upgrading of skills, and problems of retention of skilled individuals. While acknowledging a broad range of infrastructure and policy constraints in the IT cluster, the stakeholders gave high immediate priority to workforce issues to be able to take advantage of new opportunities as the policy issues are resolved.

Phase III activities of the Cluster Workforce in Development Team began in July 2000. Drawing directly on a recommendation of the strategic planning workshop, a joint Human Resource Committee was formed by six private sector IT associations to serve as the counterpart organization for phase III. The Cluster Coach and this Committee identified two priorities for the private sector associations, specialized technical and managerial training, and strengthening of the associations in their capacity to provide workforce services to their members. The team and the committee agreed to a work plan for Phase III that included five main areas.

- **Outreach activities to link businesses and educational institutions**. The pilot program involved efforts to link IT companies with computer science departments in the universities to act as sponsors and mentors for senior projects. The pilot effort yielded five collaborative projects, involving three universities and four employers. The information gathered about the perceived benefits and concerns on both sides will be used to scale up the program for the next phase.
- **The IT Opportunities Portal**. The CD-Rom based portal, an innovative tool for self-teaching and distance learning through access to free on-line certification programs, and for tapping into outsourced employment opportunities, was introduced by the Workforce Development Team. A number of universities and technical schools have indicated interest in incorporating the portal into their intranet systems. The team is now in the process of testing and customizing the portal for Egypt.
- **Pilot series of short courses on software project management**. Three short courses have been designed for bid through MDI. The association HR committee prepared a list of approximately 30 topics appropriate for short courses and of concern to the members. Listed in order of priority, these three, Software Project Planning and Management, Managing Software Projects, and Software Cost and Schedule Estimation, were among the top four and fit the MDI management focus. Delivery of these courses is planned for Spring 2001.
- **Capacity building with the IT associations**. The capacity building for Phase III was focused on the services to be provided in workforce development and human resource management. The IT Association of America (ITAA), headquartered in Arlington, Virginia, has an impressive workforce development agenda. An exchange visit by ITAA workforce development staff, planned for November 2000 did not occur because of ITAA concerns about violence in the region, and HR Committee concerns about the timing of the visit for the associations.
- **Case studies in human resource management**. The final activity under Phase III involved the writing and dissemination of three case studies of IT companies in Egypt. The studies examine particular human resource issues faced by these companies and the methods they used to resolve them. Lack of Egypt-specific examples for management of problem solving related to human resource development has been identified as a need across clusters.

USAID and GOE attention to workforce development in the IT cluster includes a broad range of training programs. It is important to understand the contribution of the Cluster Workforce Development Activity in terms of the broad context of which it is a part. USAID is supporting the government and private sector in developing "skills for competitiveness" through broad education and training programs in basic computer

literacy and in skills training for certification. The program includes support for development of private technical universities. The key role of management is recognized in the provision of short courses for executives and managers, support for MBA training in the US, and in the proposal to develop a world class business school in Egypt.

The contribution of the IT cluster workforce development activity to increasing cluster competitiveness and strengthening workforce skills lies in the construction of critical linkages between stakeholders within the cluster. By focusing on the gaps between, for example, the private sector employers and the educational institutions, the program complements and extends the other workforce programs.

Lessons Learned from Phase III Activities

The proposed follow-on activities for the IT Cluster outlined in the following section are based on the experience of the team during the six-month Phase III pilot period. This section summarizes the lessons gleaned from this experience as a base for the discussion that follows.

The outreach activities to link businesses and educational institutions received considerable support as a concept, from both employers and professors. Yet, the task of achieving concrete agreements around specific student projects proved to be difficult, fraught with distrust, and tied in most cases to personal relationships and connections. For this program to expand, it needs to be built on an impersonal contractual framework.

The pilot for the IT Opportunities portal involved the creation and pilot testing of a prototype CD. The concept of on-line learning and certification is relatively new in Egypt. A part of the task has been to introduce the portal as an innovative learning platform, and to work with Egyptian counterparts to refine the content and to determine the conditions under which it will be utilized within the Egyptian IT context. The prototype was distributed to key individuals in Egypt and the US. Their receptivity to the concept and recommendations for additional products to be added to it, particularly links to outsourcing opportunities, are reflected in the proposal for wider dissemination and enrichment of the portal in the next phase of the program.

Interactions with the IT associations during Phase III reaffirmed both the preliminary level of development of these organizations and the potential for filling an essential bridging function in the cluster. The HR committee clearly defined priorities for their workforce development agenda, but the associations lack the resources and organizational structure to pursue these programs independently at this point. Organizational strengthening is a clear priority for the future. The short courses on software project management will be the first step in this process since the HR Committee has committed the associations to manage the logistical arrangements and recruit the students for these classes.

Proposed Activities for Cluster Workforce Program in IT, 2000-2001

Phase III was the initial step toward implementation of the programs that grew out of the cluster analysis and strategic planning workshop. These were pilot activities to understand the context and the constraints in working with the associations, firms, and educational institutions, and to explore how these activities fit within the broader context of IT cluster development in Egypt. The next phase of the program envisions a scaling up of these activities, with an eye toward building sustainable mechanisms that will respond to the rapidly changing workforce demands in the cluster in a flexible and self-supporting way. Workforce development in IT is not the same as in traditional clusters. The market for services is global, and the technology itself and pace of change affect the content and configuration of linkages in the system. The program outlined in this concept paper consists of four intertwined activities to promote flexibility and the capacity to capture innovation that will promote workforce development consistent with expansion of the Egyptian IT cluster within the context of the global IT economy.

During Phase III, the Cluster Workforce Development Team has explored the potential for closer coordination between the activities that have been initiated under this program and other initiatives focused

on IT workforce development. For example, we believe it would be useful to develop linkages between the program of technical short courses for IT professionals, developed in connection with the Human Resources committee of the IT associations, with the newly formed NGO, the Association for Technical Education, led by Dr. Mostafa Kamel. Likewise, the IT Opportunities Portal may prove to be a useful tool within the setting of the anticipated Egyptian Technical Universities. These universities in turn, may be fertile ground for expanding the outreach activity with IT firms.

I. Outreach Program

The pilot outreach program sought to bring university professors and employers together in the development and mentoring of the individual projects that all students in Computer Sciences programs in Egypt are required to undertake their senior year. Making this program of academic-industry cooperation occur at all, and work effectively under Phase III, involved intensive personal and individual efforts by the Workforce Development Team.

This type of interchange between the university and the private sector is commonplace in the US, usually managed by the outreach and placement departments of the universities. In addition, private sector associations like the Information Technology Association of America (ITAA), facilitate internship and work/study placements for IT students. In Egypt, there are few examples of collaboration between industry and universities around student projects or internships, in spite of broad recognition of the need to improve the responsiveness of the universities to industry, and to expand the opportunities and incentives for graduates to work in Egypt. Traditional lack of communication between the university and the private sector across clusters, and uncertainties within the highly contested IT cluster about issues like intellectual property rights, help explain this gap.

The outreach program seeks to build a bridge between these two stakeholder groups to increase the flow of young, skilled talent into the IT cluster. The pilot program during Phase III showed the extent of distrust within the cluster and suggested solutions. The lessons from Phase III demonstrated to the Workforce Development Team that the program was certainly worth scaling up. The benefits to the students, who get real-world experience and contacts with industry, and the benefits to the industry, which gets a first-hand look at students and an opportunity to influence the academic content and outlook are significant. But, to take this program to scale in Egypt, the interactions must be depersonalized and institutionalized. While this message is contradicted by the traditional patterns of interaction in Egypt, the increasingly web-based technology of the employment market in IT, offers possibilities for moving past the traditional blocks to the agreements.

The Workforce Development Team has received a proposal from IT WORX, a young and successful IT firm that has developed a strong outreach relationship with the American University of Cairo, to develop and maintain a website to serve as a clearinghouse for posting of proposed senior projects and for negotiating the terms of the mentoring relationship. Project opportunities posted on the site by employers would be open to "bidding" by universities and students. The site also would include templates for the agreements between the university and the employer, and the student and the employer, agreeing to the terms for collaboration including the assistance to be given by the employer, the timetable for completion of the project, the responsibilities of the student and the university, and issues related to intellectual property rights. At the conclusion of each project cycle, the web site also could serve for posting all senior projects for broad dissemination across the cluster.

Initial discussions have been held with IT WORX about the steps for implementing this proposal. The web site would be developed by IT WORX at the initiation of Phase IV, based on specifications developed by a committee of employer and university representatives, formed by the Workforce Development Team. The committee would meet to development the content of the page and the templates for the agreements. The contract with IT WORX would cover site development and maintenance. The Workforce Development Team would be responsible for managing the design process, and for securing the initial input of the employers and universities to the site.

II. Rollout of the IT Opportunities Gateway Portal

The testing and refinement of the prototype of the IT Opportunities Portal, prepared by Development Informatics, a partner in the Workforce Development Team, will be complete before the initiation of Phase IV activities. The task in Phase IV will be dissemination of the portal in CD form, training in navigation and utilization of the portal, and expansion of the capabilities of the portal as a "live" tool for on-line learning and for outsourcing.

In Phase IV, the IT Opportunities Portal can become a key operational tool for expanding access to online training and certification resources by Egyptians in relatively large numbers. It will also boost present Egyptian IT training initiatives by becoming a source of new work study, internship, outsourcing and other credential-building experiences of value for workforce development and Cluster competitiveness. The Portal also offers an opportunity to explore the possibilities of a "virtual" internship program to supplement the possibilities of the outreach program on the ground. The Portal will provide links to a range of established online work-study and internship opportunities, such as those currently being offered by Hewlett Packard and other innovative IT firms in the US, Singapore, and other countries.

A two-track approach is envisaged in Phase IV for enhancement and dissemination of the portal. The first track is to develop a "public" overview version of the Portal (on a CD-ROM), intended as an orientation to the information economy and as a means of awakening interest in IT-related career paths. The main focus of this version, which is based on the prototype, will be to link Egyptian students, entrepreneurs, and IT Cluster association members to in-country and offshore sources of (free) online technical training and certification, and virtual internship/work-study opportunities. A distribution strategy will be developed to provide broad access to the public version of the CD-ROM. Among the distribution channels being considered are Internet cafes, computer hardware/software retail outlets, secondary schools, universities, and training programs desiring to offer useful resources to their audiences, as well as possible uploading to a live site on the Internet. Various media, including video material, will be applied to this disk, making it useful as a stand-alone orientation resource for users even when they lack an Internet connection.

Preparation of this CD-ROM will require feedback from focus groups of students, employers, and prospective distributors to ensure that the contents are appealing to the target audience of entry-level individuals making career choices in the IT Cluster.
Beyond the initial distribution, the team will develop a plan for getting appropriate Egyptian IT companies and institutions, such as internet cafes, universities, and cluster NGOs involved in sponsoring distribution of the CD-ROM and its updates on an ongoing and self-sustaining basis. Clearly, this aspect will be critical if the portal's on-going use and expansion within academic and entrepreneurial circles is to happen. This process of institutionalization will be a top priority of the Workforce Development Team.

The second track will be to prepare and distribute an enhanced, multi-volume CD-ROM set for Egyptian IT Cluster institutions (notably universities, associations, training programs, and incubators) that agree to serve as hosts for the Portal. The enhanced portal can be deployed in their existing Local Area Networks or Campus Area Networks. In this expanded version of the Portal, a range of IT Cluster training resources (including lectures, interviews, seminars, and workshops) will be available in on-demand learning formats, and the Portal will serve as an interface to access useful tools and services on the web. Among the proposed contents of the enhanced portal are interviews with leading Egyptian IT entrepreneurs and technical specialists in Egypt and abroad, who are willing to share their insights in digital form and/or to act as online "telementors".

The Workforce Development Team will expand the range of virtual internship and online work study programs available to Egyptian students and entrepreneurs by eliciting additional project proposals directly from multinational corporations, US IT Cluster associations, universities, and well-known information industry figures regarding research projects, multimedia courseware development, and translation that they would like to offer as project opportunities for Egyptians. Another opportunity for the virtual internship program might be to approach multinational corporations interested in building digital resources for training of new technical support staffers and creation of knowledge management systems on a global basis.

In turn, the host institutions that choose to partner with the Workforce Development Team will be asked to contribute to the content of the Portal. The exact nature of the content that is contributed will depend on the host institution's focus and outreach objectives. A part of the content might be the posting of student projects, or links to outsourcing opportunities within Egypt. The digitization of learning opportunities, including the short courses to be developed with the IT associations, also can be one of the contributions; participating host institutions may be asked to record and transcribe highlights of lectures, seminars, workshops, and interviews, to be transferred into periodically updated releases of the enhanced Portal.

These resources, along with labor and production services, will help ensure continuing relevance, local input, and updating of the Portal.

The Workforce Development Team will act in a coordinating role in assembling content and producing the initial version of the two portals, in designing and overseeing the publicity and marketing programs, and in approaching prospective sponsors (including potential corporate funding sources seeking to find and cultivate new pools of IT talent) for ongoing support. The Team will offer training and assistance in assembling the required software and hardware tools to produce content for the Portal. The Team will also offer training in the use of affordable new turnkey packages that include shareware software tools for creating streaming video learning materials and highly transportable video recording/multimedia hardware [1]. Such training will provide the partner institutions with the skills and tools required to author, create, and further enhance any subsequent versions of the portal independently, allowing them to take full ownership and content management of their customized IT Opportunities Portal. It is hoped that this, in turn, will ensure the sustainability and continuing relevance of the Portal.

III. Training Program

A key role of industry associations in the US and elsewhere is to provide resources and training to upgrade the skills of their members, to keep them abreast of new developments in the field. This function is particularly crucial for IT associations because of the pace of change in the field. The IT HR Committee identified technical and managerial training, through an on-going series of short courses, as their highest priority. The committee has prepared a list of priority courses, based on a survey of member firms about their needs and interests. To be credible, these courses must be of very high quality, and preferably delivered in collaboration with a recognized center of excellence in a US university. The first three courses, Software Project Planning and Management, Managing Software Projects, and Software Cost and Schedule Estimation, are currently being bid and contracted as a pilot for initiation of this series.

The training anticipated for this series fills a crucial niche in the spectrum of training currently available in Egypt. The training courses will involve highly technical, current topics and information for IT professionals and the owners and managers in the IT firms that form the core of the cluster. This type of in-service training, or continuous education, is necessary for the nascent local industry to be on the cutting edge of innovation, and competitive in the global context. It supplements the training offered by multinational IT firms, which is focused on their products and applications, by providing tools for adapting these products to specific problems. It is advanced training for professionals in contrast to the basic IT and certification training programs being supported by USAID under other activities.

In-service training for IT professionals must be an on-going activity. Scaling up this program will involve developing institutional structures and mechanisms for ensuring continuous access to the flow of innovation and technology, and for ensuring broad dissemination of this information across Egypt. This structure and mechanisms will be developed from the ground up because this level of training in the short-course or on-line learning format is not presently available in Egypt.

The HR Committee and the IT cluster coach have discussed the possibilities for extending the impact of this program by making the courses available in on-line and self-directed learning format through the IT Opportunities Portal. Many of the universities in the US that presently provide these types of courses also are using this technology. In this way, entrepreneurs throughout Egypt, rather than only those living in Cairo and Alexandria, could take advantage of the opportunities. Preparing the courses in this format and digitizing them would be developed as a sub-component of the continuing education training program.

The proposal for this program involves three main elements. First, the access to innovation and technology will be based in an on-going collaborative relationship with a center of excellence in a US university over two or more years. Second, institutionalizing the capacity for delivering these courses in Egypt will

---

[1] A complete "turnkey" package can be offered in a briefcase model, a backpack-transportable model, or a full cabinet model for those cases where Egyptian IT Cluster stakeholders lack the means to generate streaming video courses with their existing systems.

involve the training of Egyptian professionals and educators as trainers, and preparation of key courses in on-line learning format for dissemination outside of Cairo and Alexandria. The third element will be to establish an institutional home for the program probably as an adjunct or satellite training program to an existing educational institution or under the auspices of the Association for Technical Education. In addition, representatives of multinational IT firms, in conversations with the cluster coach, have expressed interest in collaborating in this type of program, by providing collateral training and sponsorship as they do in the US.

Once established institutionally, the content of the program will be determined by the patterns of innovation in the global IT culture, and the types of specialization that spur expansion in the Egyptian IT cluster. Building this program through a US center of excellence is essential for opening avenues to the cutting-edge developments in the field. The IT associations have a key role to play in getting this program off the ground and in ensuring the access of their members to this resource. The way in which this bridging role of the associations evolves in the future will become clear as part of the institutionalization process.

IV. Association Strengthening for Workforce Development

The IT associations in Egypt are young organizations, with limited resources, few members, and a narrow sense of their potential contribution to building the global competitiveness of the Egyptian IT cluster. The joint Human Resource Committee formed under Phase III of the project is one of the few examples of collaboration among the numerous associations. At the same time, based on experience in the US and in other clusters, industry associations are potentially important bridging organizations for workforce development within the cluster, facilitating recruitment and entry of new talent, and responding to the needs of industry for information exchange and training.

The Workforce Development Team proposes to continue working with the associations under Phase IV to seek ways to strengthen their capacity to mediate workforce demands. The cluster analysis and strategic planning workshop showed a clear lack of bridging institutions in the IT cluster. Some of this bridging can be accomplished through technology, but a role remains for the pooling and articulation of interests, and cluster based actions provided by the association.

The activities with the associations are intended to provide ties among the other components of the proposed program, to serve as avenues for dissemination of information and contacts with core cluster firms, and to move toward self-propelling programs based on these initiatives. The work with the associations over the next two years is of two types. First, the HR committee of the associations has taken the lead in developing the concept and proposed content for the short courses. They will be responsible for informing members about the courses and ensuring attendance. They also will recruit individuals for the training of trainers component of the program. The associations will continue to be involved with this program as it expands and develops.

Second, the Workforce Development Team proposes revisiting the exchange relationship between the associations and the ITAA. The ITAA has a strong workforce development program for the US market, based on strong collaboration from major IT industries and universities. They are interested in engaging in an exchange program with associations in Egypt to develop this capacity there as well. The exchange for the purpose of workforce development also would deal, of necessity, with basic issues of organizational development and financial sustainability. ITAA also serves as the secretariat for an international organization of IT associations. The involvement of the Egyptian IT associations in the global network of associations would provide another opportunity for understanding the parameters of global competitiveness and for potentially being a player in international discussions of trade and regulation. The task of the Workforce Development Team will be to initiate this exchange between the ITAA and Egypt through a visit(s) of ITAA staff to Egypt for training and technical assistance, and potentially for a return visit or internship of personnel from the Egyptian IT associations to ITAA in Washington.